

### **What is claimed is:**

**[Claim 1]** A Bi-directional Blower with the functions of suck-in ambient air and blow-out hot air from system box simultaneously for computer and electronic systems comprising:

A housing frame of molded plastics or casted metal with built-in broken walls which forms a separate zone with conjunction of blades and/or impellers to construct suck-in and blow-out channels, stationary blades and airfoils which are designed to control flow volume as well as flow directions; vents of intakes and outlets may be located on sides, top or bottom;

A molded plastics rotary part of radial blades or a combination of blades and impellers sitting on a circular plate which is extended from the drum of the rotary part;

A DC or AC motor, which rotor is mounted with the rotary blades or impellers, and the stator is assembled to the housing frame;

A cover of molded plastics or sheet metal aligned to the housing frame, which is optional depending on the application situation.

**[Claim 2]** A pressure type bi-directional blower for cooling laptop computer of claim 1, wherein the so called "negative pressure" formed behind separate zone draws air into the space between blades/impellers which drive air out through the outlets.

**[Claim 3]** A hybrid type bi-directional blower for laptop computer cooling of claim 1, wherein the inlet for suck-in ambient air may be located on top or bottom and hence this suck-in channel is centrifugal type but the blow-out hot air channel is pressure type.

**[Claim 4]** A combination of blades and impellers sitting on a circular plate extended from the drum of the rotary part in claim 1, wherein the blades provide air supply to the forward impellers which moves air out faster.

**[Claim 5]** A pressure type one way blower of claim 1, wherein there are one inlet and one outlet of the housing frame with the features of broken walls, stationary blades and airfoils which control the air

flow volume as well as direction. The blowers of this type with inlet and outlet on sides can eliminate the air gap between the bottom of a laptop and the top of the desk, so that the heat conduction through bottom side can be enhanced dramatically.

[Claim 6] A centrifugal blower with broken walls, stationary blades and airfoils of claim 1, which control air flow volume as well as directions for even air flow across the outlet area before heat sink.

[Claim 7] The generalized air exchangers, fluid pumps, wherein bi-directional flow is enabled utilizing the mechanism of claim 1, i.e., the separate zone constructed with the broken walls, blades and/or impellers, the stationary blades and tunnels to control the flow volume as well as directions.